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SCIENTIFIC BOOKS

Commercial Geography. By ALBERT PERRY BRIGHAM. Boston, Ginn & Co. 1911. 28 chapters, 449 pages, 17 colored maps and 253 illustrations. \$1.30.

This latest addition to the texts of commercial geography will very rapidly prove its worth because of the practical pedagogic principles followed in the arrangement and presentation of the material.

The great raw materials of world-wide interest and of vast significance in the commercial world are concretely presented, as Part I., in a series of chapters on wheat, cotton, cattle, iron and coal. A study of the activities centered about each of these great raw materials gives the student a broad outlook and furnishes a basis for Chapter VI. on the Principles of Commercial Geography. The discussion of raw materials before the considerations of the geographic principles will be welcomed by educators as far superior to the usual broad generalizations concerning a conglomerate hodgepodge of land forms, climate, rivers, lakes, raw materials, transportations and industry. Chapter IV. on Iron is typical of the method in which this text presents all of the five great raw materials. This chapter has excellent views, diagrams, maps and graphs.

The five types of raw materials are followed by the discussion and application of the principles to the United States which forms Part II. of the text. This presents in eleven chapters the physical features; plant, animal and mineral industries; water resources; transportation; commerce; centers of general industry and the concentration of industries. The space given to the United States is more than the average text, but this added emphasis is in accord with the general movement among educators to require from students a better understanding of our own country. The maps of production are especially clear and are constructed so that a comparison of various states and regions is very easy. The water resources of the United States is a chapter not generally considered in a commercial geography, but it

makes a most valuable addition. The concentration of industries and the centers of general industry is another innovation which is most heartily endorsed by instructors as excellent material well designed for instruction in modern commercial geography.

The foreign countries receive a brief but ample discussion for high school students. In each of the countries the proper emphasis is given the predominant industry of each individual country. The final chapter on World Commerce is an excellent application of the geographic principles which have been developed in the previous sections of the text.

In the writer's opinion this text has many points of superiority which greatly strengthen the instruction in commercial geography.

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SOME EARLY PHYSIOGRAPHIC
INFERENCES

THE inferences of early travelers as to the physiography of a region are always interesting if the traveler is a good observer. The following references may not be new to some geologists, but they were new to the writer and seem worth publishing.

Wm. Darby in his "Emigrant's Guide," 1811, states that one of the branches of the St. Francois River "appears to have been an ancient outlet of the Mississippi" (page 139). Apropos of the same region, James Hall in his "Notes on the Western States," Philadelphia, 1838, says "About midway between St. Louis and the mouth of the Ohio, masses of limestone rock are seen on either side, which, though now unconnected, have the appearance of once having formed a continuous ridge crossing the river in an oblique direction" (page 47). Both these travelers, in looking across the southeast lowlands of Missouri, inferred general truths that, taken together, would form important links in the history so admirably worked out nearly a century later by Professor C. F. Marbut.¹

¹"The Evolution of the Northern Part of the

As Darby infers, the Mississippi formerly flowed west of its present channel. It was separated from the Ohio by an interfluvium, the remnants of which are the "continuous ridge" mentioned by Hall. By two successive captures the Ohio diverted the Mississippi; the final capture led the Mississippi through its present gorge where the "masses of limestone rock are seen on either side."

Henri Peyroux de la Condreniere, commandant at Ste. Genevieve from 1787 to 1796, was a man of considerable scientific ability. In one of his essays he maintains that the Great Lakes formerly discharged into the Mississippi by way of the Illinois River. He reasons that the valley is too wide and deep to have been eroded by the present Illinois River. Another reason quoted is not so well founded; the "vast alluvium" stretching along the Mississippi to the Gulf is also held to indicate a drainage from the Great Lakes. This conjecture is an interesting prelude to the work which has shown the extent and drainage of those great marginal glacial lakes that preceded the present Great Lakes. The quotation has been handed down by Brackenridge, the lawyer-traveler in his "Recollections of the West," second edition, Philadelphia, 1868 (page 241). He (Brackenridge) adds prophetically "At no distant day the labor and ingenuity of man will restore the connection between the Lakes and the Mississippi by means of an artificial channel."

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SPECIAL ARTICLES

HORNS IN SHEEP AS A TYPICAL SEX-LIMITED CHARACTER¹

SEVERAL years ago Wood (1905) published a note in which he showed that, in a cross between a Dorset Horn and a Suffolk (belonging to the Lowlands of Southeast Missouri," University of Missouri Studies, Vol. I., No. 3, 1902.

¹Joint contribution from the New Hampshire Agricultural Experiment Station and the Station for Experimental Evolution, Carnegie Institution of Washington.

ing to a hornless breed of sheep), the male offspring all developed horns but the female offspring remained hornless. He showed further that in the F_2 generation hornless males arise, and these do not carry the determiner for horns, and horned females, but only when they have the determiner duplex. Bateson (1909, p. 173) has discussed these facts and drawn the conclusion: "Sex itself acts as a specific interference, stopping or inhibiting the effects of a dominant factor, and it is not a little remarkable that the inhibition occurs always, so far as we know, in the female, never in the male." He admits, however, the difficulty in distinguishing between this probability and the other possibility; viz., that the male provides a stimulating factor. Castle (1911, p. 102) concludes that the reason horns are more strongly developed in males than females is "the presence of the male sex-gland in the body, or rather probably some substance given off into the blood from the sex gland, favoring growth of the horns"; and he adds that if the male Merino sheep (in which, usually, the male, and the male only is horned) is castrated early in life no horns are formed. He gives no reference for the last statement; and in view of the variability of the horned condition in the males of the "Merinos" the conditions of the experiments would have to be carefully considered before such a result could be accepted as settling the question of the dependence of horns in heterozygous males upon a secretion from the testis.

The hypothesis that we have adopted and which works with entire satisfaction assumes, first, that, as in man so in sheep, the male is heterozygous (simplex) in sex. One sex-chromosome is then to be expected in the male, and substantially this condition has been found to hold for man by Guyer (1910). The female will then be duplex in respect to sex. One further assumption is necessary; there is an inhibitor to horn formation, and this is located on the sex chromosome; consequently it is simplex in the male and duplex in the female. Thus it belongs to the well-known class of sex-limited characters. The inhibi-